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DEVELOPMENT OF A FIELD-ORIENTED MEASURE OF SOLDIER MORALE

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Behavioral and Social Sciences (Borman & Bleda, 1978). In the earlier project, subscale scores on a lengthy battery of self-report instruments were submitted to factor analysis, and six dimensions of motivation and morale were identified. Nineteen subscales, many consisting of large numbers of items, appeared to assess these factors. Our reanalysis of the Borman and Bleda data resulted in reducing the number of items (200) on these scales to 64 questions assessing the same six dimensions. Efforts were also made to simplify the working and scoring of items to facilitate use of the instrument in the field, such as serving as a portion of the "Troop Preparedness Estimate," a measure of personnel combat readiness.



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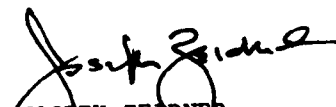
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FOREWORD

Sustaining the personnel of our fighting force is of critical concern in today's Army. Deepened sensitivity to soldier morale, esprit, and job satisfaction as major contributors to combat effectiveness has prompted the Army to, among other innovations, expand the role of the battalion S1 officer. In the future functions of the S1 will extend beyond traditional matters of personnel administration to the more challenging concerns of personnel management.

The Army has established a broad based six-week curriculum in applied personnel management at the Soldier Support Center to train S1s to accurately apprise the commander on the total status of unit members as regards morale, skills, numbers, etc. To assist the Soldier Support Center in developing and refining its curricular content, the Army Research Institute for the Behavioral and Social Sciences is in the process of constructing and proposing tools to aid the S1 in his more demanding role. This report is the result of a collaboration by the Army Research Institute, the U.S. Army Institute of Personnel Management, and the U.S. Military Academy. The report describes the development of a brief and easily scored measure of six important soldier motivation and morale dimensions. The status of unit personnel in these domains will be of major concern to the S1 in his most critical function of accurately informing the battalion commander on the unit's preparedness for combat. It is hoped that this personnel survey instrument will assist the S1 in this role.


JOSEPH ZEIDNER
Technical Director

DEVELOPMENT OF A FIELD-ORIENTED MEASURE OF SOLDIER MORALE

BRIEF

Requirement:

Recruitment, retention, and readiness of soldiers are at least partially determined by complex attitudinal characteristics such as motivation and morale. The aim of this project has been to develop brief, practical measures of several of these dimensions.

Procedure:

Past research efforts (Borman & Bleda, 1978; Johnson, Motowidlo, & Dunnette, 1975; Motowidlo, Dowell, Hopp, Borman, Johnson, & Dunnette, 1976) involved comprehensively reviewing literature on motivation and morale including survey instruments designed to assess these attitudes. A variety of promising measures were then administered to samples of soldiers in Korea and in Germany as well as in the National Guard. Factor analyses of test-by-test intercorrelational matrices yielded six conceptually meaningful scales. The current project employed serial principal component analyses and regression analyses to substantially reduce and simplify the pool of items necessary to assess the Borman and Bleda factors.

Findings:

Inspection of the results of component analyses, regression analyses, and internal consistency reliabilities suggested that five of the six dimensions could be measured efficiently with 64 dichotomously scored items. Internal consistencies for five of scales ranged from .83 to .91. The motivation scale consisting of only five items seemed promising but, due to its extreme brevity, somewhat low in internal consistency (.56). Scores on this scale should therefore be interpreted with caution.

Utilization of Findings:

The revised survey would seem to be of considerable practical value at the field-operating level of the Army. It is anticipated that it will be used primarily by battalion SIs, who are commonly trained in combat arms rather than in behavioral science. Use of the instrument requires a 64-item questionnaire, a single page scoring template, a table of norms, and a brief description of the six dimensions. It is estimated that subjects can complete the survey in 10 to 15 minutes and that administrators would need no more than 2 minutes to handscore profiles. The scales may also prove of value to behavioral scientists involved in conducting research on determinants and effects of soldier morale.

DEVELOPMENT OF A FIELD-ORIENTED MEASURE OF SOLDIER MORALE

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DEVELOPMENT OF A FIELD-ORIENTED MEASURE OF SOLDIER MORALE

INTRODUCTION

Recruitment, retention, reenlistment, and productivity are serious problems to the Army as it confronts an ever-expanding mission with generally fixed, limited numbers of personnel. To analyze and attempt to resolve these manpower problems, field commanders have traditionally invoked notions of soldier cohesion, commitment, esprit, etc. Military leaders have, however, experienced difficulty in quantitatively assessing these constructs. For its part, moreover, behavioral science research has typically failed to demonstrate powerful causal relationships between soldier attitudinal variables and overt behaviors. Part of this is due to the difficulty in measuring major aspects of motivation and morale.

This research effort adheres to the common assumption that morale substantially contributes to combat effectiveness. While research literature definitely demonstrating the causal role of morale in unit effectiveness has not been located, military thinkers through the ages have posited that strong relationships exist. Several of their comments are contained in a review on combat motivation by Kellett (1980) and are cited here. The ancient military commentator Xenophon wrote that: "not number or strength bring victory in war, but whichever Army goes into battle stronger in spirit, their enemies generally cannot withstand." Napoleon observed: "A la guerre, les trois quarts (sont) des affaires morales, la balance des forces nees n'est-ce que pour un autre quart." In this century the British general Montgomery affirmed: "The morale of the soldier is the greatest single factor in war."

Currently indices of morale are not a part of the Unit Readiness Report. If, however, practical measures could be developed, they might well be reasonably included so that commanders could more fully gauge the readiness of their forces and thus improve their ability to plan combat strategy and tactics. The Troop Preparedness Estimate does include several morale concepts but as yet SIs have no formal instruments to assess these dimensions.

The immediate goal of this project is to develop an expedient measure of several morale dimensions which can be employed by SIs as a part of the Troop Preparedness Estimate. Other uses of the measure may be anticipated such as: establishing Army trends in unit morale; evaluating the impact on personnel of changes in army personnel management techniques, entitlements, and human resource management programs; and, perhaps, contributing to future behavioral science research.

BACKGROUND

This research project was based on earlier work by Borman et al. (1975), Borman & Bleda (1978), and Motowidlo et al. (1976). Results

of that investigation are synopsized as a necessary background to understanding the current project. The Borman et al. (1975) review of the literature, supplemented by the judgment of ARI researchers, revealed 66 subscales or separate items which by dint of their reported validities, reliabilities, and/or widespread use appeared promising in assessing Army job satisfaction, motivation, and morale. Most of these measures, (originally consisting of 741 items) were administered to enlisted personnel E-1 through E-5 serving in the Eighth Army (Korea), the Seventh Army (Germany), and the Minnesota National Guard. Based on a series of multivariate analyses as well as on conceptual considerations deriving from their review of the literature on motivation, satisfaction and morale, the investigators found that six constructs were measured well by 19 of the scales. Table 1 is extracted from their report and delineates each measure by the construct it seemed to assess. (For a detailed description of the theoretical/statistical rationale adopted, the reader is directed to Borman and Bleda's report cited above.)

Both the literature review and final scales are helpful to staff officers and researchers. Nevertheless the battery consisting of 200 items was not considered sufficiently parsimonious to be routinely administered and scored by Army personnel. Our task was to reduce testing administration requirements without compromising desirable psychometric properties.

METHODOLOGY AND RATIONALE

Protocols from 1200 of the Borman and Bleda subjects were located, and responses were isolated for all items corresponding to the scales noted in Table 1. The six sets of measures noted in Table 1 were identified by the earlier research team as providing the best general indicators of the motivation/morale constructs. This chapter describes the statistical methodology and rationale which guided our efforts to reduce scale length yet measure the same six dimensions. While we believe that the strategy adopted provides a reasonable solution, we do not purport that this is the only feasible conceptualization of the problem or the only way to resolve it. We selected this particular approach because of a strong desire to maintain the construct validity of the factors identified by Borman and Bleda while reducing the length of the scales and simplifying scoring.

Fifty items were immediately deleted from consideration for inclusion in the ultimate field survey. These items were from the valence times expectancy subscale. In that the derivation of a subject's score requires computation (i.e., multiplying respective valences and expectancies), these items were eliminated since it had been earlier determined that the final instrument should be easily scored in order to be practical in field administration.

The other items remaining on each of the six scales were submitted to separate principal component analyses with unities imposed as diagonal elements. In each of the resulting analyses, an item's loading on the

TABLE 1

Borman and Bleda's Final Constructs,
Scales/Items, and Scale Internal Consistencies (in Parentheses)

Constructs	Scales/Items (Coefficient alphas)
Motivation	Self-Rating of Effort/1 Item Sum of Valence x Expectancies/50 Items (.93) Patchen Motivation Scales/4 Items (.40)
Overall Satisfaction with the Army	Cureton's Satisfaction with Army/12 Items (.89) Prior Expectancies about Army Life/24 Items (.92) Survey of Organizations, Overall Satisfaction/1 Item
Satisfaction with Job	Brayfield-Rothe Job Satisfaction/18 Items (.87) Cureton's Job Satisfaction/8 Items (.86) Job Description Index, Work/18 Items (.83) Sears Kind of Work/6 Items (.70) Survey of Organizations, Satisfaction with Job/1 Item
Satisfaction with Superiors	Job Description Index, Supervision/18 Items (.89) Sears Supervision/6 Items (.71) Survey of Organizations, Supervisory Support/1 Item
Satisfaction with Co-workers	Job Description Index, Co-workers/18 Items (.90) Survey of Organizations, Peer Support/3 Items (.84) Survey of Organizations, Satisfaction with Co-Workers/ 1 Item.
Satisfaction with Pay	Job Description Index, Pay/9 Items (.75) Survey of Organizations, Satisfaction with Pay/1 Item

Note. This table borrows heavily from that presented in Borman & Bleda, 1978, report.

first, unrotated principal component was noted. It was assumed that the first principal component represented the best available measure of each construct although it is likely that these first principal components may have been somewhat "contaminated" by methods variance as well as a general factor dealing with overall positive opinion toward working in the Army.

On the basis of the six principal component analyses, any item not loading $>.30$ in its respective analysis was eliminated from further scale development. It was felt that items loading $>.30$ were not salient in defining the six constructs. Furthermore, deleting low-loading items would augment the internal consistencies of the final scales.

For the remaining analyses, all multi-point responses to items were dichotomized in order to predict the likely effects of such a simplified response format on the psychometric characteristics of the scales. Options to questions with neutral response alternatives were divided so that the scale midpoint was always scored as a "positive" affective response. The "?" response of the Job Descriptive Index was also scored as positive. (See Tables A through F in appendix which provide the percentages of original neutral responses per item for each of the six dimensions.) It was decided to combine the neutral responses with the "positive" end of the response alternatives to permit easier instructions to future subjects.

As the primary method of item selection, multiple regression analyses were computed. In each of the six regression analyses, the predictors were the scale's respective items which had loaded $>.30$ on the first principal component. Items loading $>.40$ were entered hierarchically, whereas items loading between $.30$ and $.39$ were entered in stepwise fashion subsequent to all possible hierarchical inclusions. In the hierarchical portion of each regression, items were entered into the regression equation in order of the magnitude of their loadings. The criterion for each regression analysis was always the unweighted, linear sum of all items loading $>.30$ on the first principal component. These regression analyses, therefore, explicated item-total relationships for each scale. The hierarchical and stepwise regression procedures were complementary. The former method of inclusion assured that items which would contribute substantially to internal consistency were considered. The stepwise technique, however, permitted inclusion of items which, while sharing less variance with other predictors, might nevertheless uniquely account for portions of the criterion variance. In these analyses, parameters were chosen that specified an F of 1.00 for a predictor to enter or be deleted. Tolerance (i.e., variance of a predictor not shared with other predictors) was set at 10% . In five of six scales, the items necessary to account for at least 95% of the criterion's (i.e., total's) variance were retained as candidates for the final scale. In the motivation scale, consisting of only five questions, all items were retained, although the 95% cut-off was exceeded before entry of the last item.

The items that resulted from these statistical analyses were then refined on the basis of rational and practical considerations. Items were eliminated if they were deemed redundant to other items and if

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their exclusion did not seriously weaken internal consistency reliability of the scale. Final scale internal consistency reliabilities (coefficient alphas) were calculated to determine if each scale's items were tapping a common dimension. Moreover, scale interrelationships were checked in order to assure that the scale scores had acceptable degrees of discriminant and convergent validity. Even though the scale constructs might be logically orthogonal, the total absence of interscale correlation was not expected because the interrelationships of the scale scores are subject to several common influences (e.g., methods variance, a likely general factor, social desirability, etc.). The wording and format of items retained for the final scale were modified only to the degree necessary to achieve a uniform checklist of questions with one set of instructions.

RESULTS

Findings of the project will be presented in the same order as were the statistical procedures in the previous chapter:

First Principal Components

Table 2 displays the eigenvalues and corresponding percentages of variance explained by each of the six first principal components. Unities were maintained as diagonal elements in the item-by-item intercorrelation matrices. As is evident from examining Table 2, the first principal components tend to account for somewhat in excess of one-third of the variance of all the items in Borman and Bleda's clusters. Seven items failed to load $>.30$ and were thus dropped from further consideration.

Tables 3 through 8 present the results of the multiple regression analyses as well as the items which served as predictors. Items are ordered from that with the highest loading on the first principal component to that with the lowest loading. Therefore, the lists provide good synopsis of each component even though some items with lower loadings are not included (see below).

Motivation (Table 3)

In the abstract, work motivation can be viewed as an inner force to initiate, direct, and maintain a work-related activity (Steers & Porter, 1975). This brief scale attempted to capture indices of this construct including effort expended, work commitment, and general activity level within the work setting. Thus, the items represented direct assessments and not the more complex calculations of expectancy theory.

Army Satisfaction (Table 4)

This factor appears to assess attitudes related to living in the Army as an institution as opposed to one's feelings toward his specific work assignment. The dimension seems quite general and deals with perceived opportunities which the Army offers, Army life-style, and general organizational climate.

TABLE 2

Eigenvalues from Principal Component Analysis
of each Original Cluster of Motivation
and Satisfaction Items

<u>Original Item Cluster</u>	<u>Eigenvalue of Each Cluster's First Principal Component</u>	<u>% of Variance Explained by Each Cluster's First Principal Component</u>
Motivation (5 items)	2.21	44.2
Army Satisfaction (37 items)	13.78	37.2
Work Satisfaction (51 items)	17.60	34.5
Satisfaction with Supervisor (25 items)	9.45	37.8
Satisfaction with Co-Workers (22 items)	7.98	36.3
Satisfaction with Pay (10 items)	3.91	39.1

Note. Mean \bar{n} per cluster: Motivation (1150), Army Satisfaction (1113), Work Satisfaction (1085), Supervisor Satisfaction (1065), Co-Worker Satisfaction (1109), Pay Satisfaction (1148)

TABLE 3

Item-Total^a Relationships for Motivation

Items Retained	Simple r	Cumulative R	% of Variance Explained
Amount of effort in work	.65	.65	42
Involved in job	.72	.84	71
Time seems to drag*	.64	.91	82
Do "extra" work	.60	.97	95
Work harder than peers	.37	.99	99

^aTotal = an unweighted linear sum of all 5 items loading >.30 on the first principal component.

*Items scored negatively.

TABLE 4
Item-Total^a Relationships for Army Satisfaction

Items Retained ^b	Simple r	Cumulative R	% of Variance Explained
Opportunities for worthwhile work	.65	.65	43
Opportunities for interesting work	.61	.73	54
Army's policies and practices	.66	.82	67
Amount of personal freedom	.65	.87	75
Opportunities for using abilities	.61	.88	77
Amount of recognition for good work	.58	.89	79
Opportunities for training	.60	.90	80
Opportunities for planning life	.64	.91	84
Immediate supervisors	.58	.92	84
Working conditions	.53	.92	84
Army attitude in civilian life	.58	.95	89
Army vs other organizations	.58	.96	92
Happy now vs before joining	.63	.97	95

^aTotal = an unweighted linear sum of all 36 items loading $>.30$ on the first principal component.

^b13 items retained for final scale, because they explained at least 95% of the variance in the Total.

Work Satisfaction (Table 5)

This scale was directed toward measuring satisfaction resulting from the intrinsic, rather than the extrinsic, qualities of the task. Thus, items involved personal reward derived from the "process" of work and also from the successful completion of the task. Moreover, specific reasons for enjoyment of the work were tapped such as it being interesting, meaningful, challenging and providing one with a sense of pride and accomplishment.

Satisfaction with Supervisor (Table 6)

The items loading on this scale all deal with the favorableness of one's perceptions of the supervisor. Some of these judgments are of a global affective nature (e.g., all in all, I am satisfied with my supervisor). Other questions are specific and allude to concrete traits/characteristics of the supervisor (e.g., supervisor is annoying, intelligent, around when needed, etc.). Most questions involve the respondent's views of the interpersonal rather than technical skills of the supervisor (e.g., supervisor is annoying, around when needed, praises good work).

Satisfaction with Co-Workers (Table 7)

Somewhat unlike the Satisfaction with Supervisor factor, this dimension involves very little of a general perception but consists almost entirely of items rating co-workers on individual traits and behavior patterns. This factor also seems to lack much of the interpersonal flavor of the supervisor factor. The dimension primarily deals with rating peers on their own characteristics as opposed to rating peers on the basis of how they relate socially to the respondent (e.g., co-worker as responsible, intelligent, and active).

Satisfaction with Pay (Table 8)

The final component involves perceptions of pay in terms of amount, adequacy of pay as the means of maintaining one's life style, and personal implications of pay (i.e., quid pro quo vis a vis effort and desirability of amount).

Regression Analyses

Tables 4 through 8 indicate the items (now dichotomized) necessary to account for at least 95% of the criterion's variance. Using this cutoff rule, several of the remaining 143 items were eliminated. This rule was not deemed appropriate for the Motivation Scale (Table 3) because it had only a few items, and thus, no items on this scale were deleted. Following the regression analyses, 69 items remained on the six scales: all 5 Motivation items, 13 out of 37 Army Satisfaction items, 12 out of 51 Work Satisfaction items, 15 out of 25 Satisfaction with Supervisor items, 16 out of 22 Satisfaction with Co-Worker items, and 8 out of 10 Satisfaction with Pay items.

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TABLE 5

Item-Total^a Relationships for Work Satisfaction

Item Retained ^b	Simple r	Cumulative R	% of Variance Explained
Real enjoyment in work	.74	.74	55
All in all, job satisfaction	.68	.82	67
Interest in job	.71	.89	78
Feeling of pride from work	.70	.90	81
Satisfying work	.75	.93	86
Things enjoyed on job	.43	.94	88
Good work	.74	.95	90
Sense of accomplishment at work	.73	.96	92
Boring work*	.73	.97	94
Accomplished something worthwhile	.57	.97	94
Job usually interesting	.63	.97	94
Challenging work	.69	.98	95

^aTotal = an unweighted linear sum of all 45 items loading >.30 on first principal component.

^b12 items retained for final scale, because they explained at least 95% of the variance in the Total.

*Item scored negatively.

TABLE 6

Item-Total^a Relationships for Satisfaction with Supervisor

Items Retained ^b	Simple r	Cumulative R	% of Variance Explained
Satisfaction with supervisor	.61	.61	37
All in a 1, supervisor satisfaction	.62	.74	55
Supervisor's good vs bad traits	.41	.76	57
Annoying supervisor*	.70	.85	72
Intelligent supervisor	.68	.89	80
Bad supervisor*	.64	.91	82
Supervisor around when needed	.69	.92	86
Impolite supervisor*	.65	.94	88
Supervisor praises good work	.70	.95	91
Supervisor knows job well	.68	.96	93
Hard to please supervisor*	.63	.97	93
Stubborn supervisor*	.60	.97	94
Up-to-date supervisor	.64	.97	94
Lazy supervisor*	.54	.97	94
Supervisor encourages extra effort	.56	.98	96

^aTotal = an unweighted linear sum of all 25 items loading $>.30$ on the first principal component.

^b15 items retained for final scale, because they explained at least 95% of the variance in the Total.

*Item scored negatively.

TABLE 7

Item-Total^a Relationships with Co-Workers Satisfaction

Items Retained ^b	Simple r	Cumulative R	% of Variance Explained
Stupid co-workers*	.70	.70	48
Unpleasant co-workers*	.69	.78	61
Lazy co-workers*	.68	.83	68
Intelligent co-workers	.68	.87	75
Slow co-workers*	.68	.89	80
Responsible co-workers	.67	.91	82
Active co-workers	.68	.92	85
Easy to make co-worker enemies*	.65	.94	88
Boring co-workers*	.64	.94	89
Loyal co-workers	.66	.95	91
Smart co-workers	.65	.96	92
Co-Workers talk too much*	.58	.96	92
Co-Workers have narrow interests*	.61	.96	93
Hard to meet co-workers*	.54	.97	93
Fast co-workers	.59	.97	94
All in all, work group satisfaction	.42	.97	95

^aTotal = an unweighted linear sum of all 22 items loading $>.30$ on the first principal component.

^b16 items retained for final scale, because they explained at least 95% of the variance in the Total.

*Item scored negatively.

TABLE 8

Item-Total^a Relationships for Satisfaction with Pay

Items Retained ^b	Simple r	Cumulative R	% of Variance Explained
Bad pay*	.77	.77	59
Underpaid*	.76	.87	76
Adequate income for normal expenses	.70	.90	82
Barely live on income*	.69	.92	85
Pay satisfaction considering skills and effort	.62	.94	89
Pay is less than I deserve*	.64	.96	92
Insecure pay*	.58	.97	94
Satisfactory benefits	.57	.98	97

^aTotal = an unweighted linear sum of all ten items loading >.30 on the first principal component.

^bEight items retained for final scale, because they explained at least 95% of the variance in the Total.

*Item scored negatively.

Since the items were entered into each analysis in order of the magnitude of their loadings on the first principal component the items that were deleted all had lower loadings than did any of the retained items. All of the 69 remaining items had loadings $>.50$ with mean loadings of .66 on Motivation, .70 on Army Satisfaction, .74 on Work Satisfaction, .67 on Satisfaction with Supervisor, .64 on Satisfaction with Co-Workers, and .65 on Satisfaction with Pay.

No item in any of the regressions was dropped from the predictor composite because its F value was too low or because it failed the 10% tolerance specification. Therefore, the scale descriptions provided above were still appropriate after the regressions, because none of the high loading items were deleted.

Internal Consistencies and Scale Intercorrelations

Examination of the dichotomized regression items revealed no extreme p -values but some redundancy of question content. Based on this duplication, five items (four on the Work Satisfaction and one on the Satisfaction with Supervisor scales) were deleted. The elimination of these items did not substantially influence the internal consistencies of the scales (coefficient alpha dropped .019 on Work Satisfaction and .004 on Satisfaction with Supervisor), nor did it influence the intercorrelations between scores on varying scales (mean unsigned difference in $r = .001$). Thus, the final scales had a total of 64 items.

Table 9 demonstrates that the scale internal consistencies as assessed by coefficient alpha were all in excess of .80 with the exception of the motivation scale which had only five items. This last scale, while conceptually important, has an internal consistency of only .56, a value so low that this scale should be used with caution in applied settings. With the exception of the internal consistency coefficient for the motivation scale, coefficient alphas in the current investigation are in the same range (.85 to .94) as those reported for the Survey of Organizations (Taylor & Bowers, 1972), are similar to scale internal consistencies reported by Bauer, Stout, & Holz (1977) in their measures of organizational perceptions, and compare favorably with those of the General Organization Questionnaire (mean internal consistency coefficient of .75) in an Army unit (Walizer & Mietus, 1980). The current internal consistencies are especially gratifying considering that they are computed on dichotomously scored items.

Table 9 also provides the correlations between subjects' scores on scales. It should be stressed that the correlations are between scores not between scales per se. It is not possible to derive the scale-by-scale correlations since the six scales were derived from different principal component analyses. (More will be said about this issue later in the report.)

The interscale score correlations in Table 9 suggests that there is at least a moderate relationship between one's standing on a dimension and his replacement on another dimension. Also, the three largest correlations

TABLE 9

Coefficient Alpha Reliabilities and Intercorrelations Between
Scores on Six Final Motivation and Satisfaction Scales

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Motivation (1)	(.56)					
Army Satisfaction (2)	.34	(.88)				
Work Satisfaction (3)	.62	.57	(.89)			
Satisfaction with Supervisor (4)	.26	.58	.40	(.89)		
Satisfaction with Co-Workers (5)	.15	.33	.28	.42	(.91)	
Satisfaction with Pay(6)	.19	.36	.26	.37	.25	(.83)

Note. Coefficient alpha appears within parentheses. Pairwise deletion of missing data resulted in a mean $\bar{n} = 727$. All intercorrelations are significant ($p \leq .001$).

($r > .50$) are reasonable given the constructs involved: Motivation and Work Satisfaction are highly related, and this reflects, the intrinsic orientation of both scales (e.g., work involvement). It also replicates past literature showing that satisfaction with intrinsic task characteristics are more powerful determinants of work performance than are external characteristics. The relationships of Work Satisfaction and Supervisor Satisfaction within Army Satisfaction reflect the global nature of the latter scale and the importance of work and supervisor in determining a soldier's quality of life in the Army institution.

DISCUSSION

Research literature concerning job motivation and satisfaction is very extensive and has shown their importance for both civilian organizations and military units. Borman and Bleda (1978), Borman et al. (1975), and Motowidlo et al. (1976) reviewed this literature, summarized motivation and satisfaction theory and measurement, and then used this information to empirically identify a motivation construct and five satisfaction constructs in a military context. Since their results provide the theoretical and quantitative bases for the current project, their review and work provided a priori parameters for our findings. That is, we reanalyzed the pool of 200 items identified by Borman and Bleda's scale-by-scale analyses and imposed their factor structure on the items. We believe that these limitations, rather than undermining our findings, strengthen them since the six a priori constructs seem to relate meaningfully with several important military behavioral outcomes. For example reenlistment has been shown to be closely related to work satisfaction (e.g., Allen, 1981) and is a critical soldier behavior in terms of unit effectiveness since the mission cannot be adequately performed without sufficient numbers of experienced soldiers.

It is important to determine whether the factorial structure of satisfaction identified by Borman and Bleda is common to varied work settings since many of the original measures were primarily designed for use in a specific civilian work situation. Also, since SI's are found in differing kinds of battalions, it is advisable to determine if the dimensions vary as a function of type of battalion. Two reviews can be cited which address the comparability of satisfaction dimensions across dissimilar work settings.

Smith, Kendall, and Hulin (1969), in their text describing the rationale underlying the Job description Index (JDI), summarized many earlier projects investigating the factorial structure of job satisfaction. While these studies involved a broad range of measures, occupations, and organizations, Smith et al. concluded that if differences in terminology were taken into account a consistent structure of factors emerges. These are a general factor, pay and material rewards, work itself, supervision, and co-workers. The general factor includes satisfaction with company policies and with the organization as a place to work.

Locke (1976), in his review of the basic dimensions of job satisfaction, argued that conceptual factors should be prepotent to purely factorial dimensions. Nevertheless, he noted that nine components have typically been found in previous research: work, pay, promotions, recognition, benefits, working conditions, supervision, co-workers, and company and management.

These reviews indicate the bulk of the research shows: (a) the important dimensions of job satisfaction are limited in number and similar to those found by Borman and Bleda and subsequently used in this research; and (b) the dimensions are largely invariant over a broad spectrum of occupational settings. That is, measuring satisfaction with the organization (i.e., Army), work, supervisor, co-workers, and pay has substantial precedent and has been useful in a variety of situations. Idiosyncratic factors could result if studies involved a different level of taxonomic analysis (Campbell & Pritchard, 1976; Locke, 1976). For instance, a highly specific taxonomy would be appropriate for measuring individual soldier differences in order to explain all of their job-related attitudinal variability. Indeed, personal qualities such as cognitive complexity (Jones & Butler, 1980) or other personality and background differences (O'Reilly, Parlette, & Bloom, 1980) may influence job perceptions. This measure, however, is aimed at a level of analysis which stresses unit measurement (e.g., platoons, companies, etc.) and aggregating scores across individual soldiers rather than emphasizing individual's scores. The specific items of the Army Satisfaction scale are intended to be particular to the Army even though the global nature of the scale is somewhat generic. Moreover, this scale maintains a view of the Army as an "institution" rather than as an "occupation" (Moskos, 1978). On the whole, the satisfaction and motivation factors tapped by our measure seem to fit a variety of purposes and seem to be at a productive level of specificity.

Other recent references which investigated the generalizability of the factors of organizational climate, a much broader domain than job satisfaction, are pertinent here because they involve military personnel. In general, the following references give evidence that the factors obtained from perceptions of military organizations are congruent with those obtained from civilian organizations and other military units. Jones and James (1979) found that the factor structures of 35 a priori clusters of items were quite similar for Navy enlisted personnel, firemen, and health care employees with five of the six retained factors (leadership facilitation and support; workgroup cooperation; friendliness and warmth; conflict and ambiguity; professional organizational esprit; and job challenge, importance, and variety) being identical across the three subject pools. These results are particularly noteworthy considering the differences in the sample groups' occupations, ages (mean ages ranged from 23 to 42), educational backgrounds (averages from 12 years to college graduate), and sex composition (all male to slightly over half female). The study is of further interest to us since one of the samples was enlisted military, albeit Navy rather than Army.

In a research report which considered whether the factor structure of organizational climate differed across Army units, Sterling and Mietus (1980) found that factors derived from the General Organizational Questionnaire (GOQ) were stable between two types of Army organizations. While the two units differed in degree of technology and centralized control, four of the five factors (unit climate, supervisory leadership, group cohesion, and mission accomplishment) had coefficients of congruence of at least .92. Although not a factor analytic study, one other project is relevant to our interests. Segal (1978) found that American military personnel rate aspects of their job at the same levels of importance as do civilian counterparts (although military tend to be less satisfied with their reinforcement on these).

Given the potential value of the six factors upon which the instrument was built, it is important to next consider if the resulting survey faithfully measures these constructs. While construct validity is both a conceptual and an empirical problem (see Needs for Further Research below), we believe that, even beyond the face validity of the items, a strong case may be made that the factors have a high degree of integrity based on the methodology and findings of this research. A number of considerations lead to this conclusion:

1. The amounts of variance accounted for by the first principal components are substantial.
2. The use of ordered hierarchical multiple regression for item selection "builds in" a high degree of internal consistency.
3. Choosing enough items to account for 95% of the variance in the criterion allowed the differential complexity of the conceptual domains to be preserved in the final scales.
4. Minimum loadings of the items in the final scales were large.
5. Five of the six scales demonstrated high coefficient alphas.
6. The five items with obvious verbal redundancy were deleted. (Retaining these items would have artificially elevated internal consistencies. Iteratively deleting items based solely on the fact that their omission would not diminish scale internal consistency would, however, have increased the risk that items might remain, not because they were the best questions for future soldier samples, but because of current specific sample-item interactions.)
7. Scale-by-scale intercorrelations and within scale reliabilities indicate reasonable levels of discriminability and convergence.

Needs for Further Research

Preliminary indications are that the instrument has promise from a practical as well as a conceptual viewpoint, and this encourages one to

believe that it has much potential in a field Army setting. Nevertheless, the instrument described in this report requires additional research before its utility as an aid in assessing soldier morale can be determined. Future stages in instrument development include the following:

1. Scale norms should be derived using several kinds of Army personnel differing on dimensions such as nature of unit mission, military specialty, unit leadership structure, etc.

2. With the addition of our scale, there are at least five instruments designed to measure unit morale: the Commander's Unit Analysis Profile (Army Research Institute, Note 1), the Command Climate Survey O'Mara, Note 2), the Army Work Environment Questionnaire (Daziel, Klemp, Cullen, & Duffy, 1980), and the Survey of Military Personnel Job and Career Satisfaction (US Army Military Personnel Center, Note 3). It is important to understand how these instruments differ in terms of psychometric properties, preferred areas of use (research vs applied field morale monitoring), scopes of content, and relative practicalities.

3. A motivation scale with higher internal consistency is needed. This scale might be found in instruments such as those cited in 2 above or might need to be constructed. The current five items have interesting content, but the scale should probably exceed this length if it is to reliably assess a dimension as conceptually complex as motivation (cf. Lord & Novick, 1968).

4. A scale-by-scale factor analysis of the normative data would be helpful in understanding the relationships of the scales to each other. On the other hand, an item-by-item factor analysis would also be of value in determining if the survey questions are currently placed in the most appropriate scales and if dichotomizing the items has had substantial impact. The statistical approach employed by Borman and Bleda (1978) as well as that followed in the present project in no way guarantee that items are placed on the scale with which they correlate most highly.

5. If separate factor analyses (either scale-by-scale or item-by-item) were performed in units differing on parameters such as nature of unit mission, size, location, etc., it would be possible to compute coefficients of congruence (Mulaik, 1972) indicating the degree to which the dimensions of soldier morale are invariant across these differing conditions. While the Sterling and Mietus (1980) report cited earlier is encouraging in this regard, it looked at only two types of units and was concerned with organizational climate rather than satisfaction/motivation.

6. Criterion-related validity investigations should be conducted to determine what the important outcomes of soldier morale are. In seeking dependent variables, one should look primarily for criteria which are reliably measurable, directly contribute to readiness, and to which the six morale dimensions are sensitive (i.e., if a morale score changes, the criterion will change rapidly thereafter).

7. Finally, as an applied field survey several practical questions

- a. How can the instrument be most expediently administered, scored, and interpreted?
- b. Can archival data (e.g., rates of AWOL and DFR, drug/alcohol abuse, reenlistment rate, SQT results, etc.) be found which will augment the survey findings?
- c. Will SI's and commanders find the six scores helpful to them in assessing troop preparedness?
- d. How will potentially threatening results be accepted by unit leadership, particularly scores from the satisfaction with supervisor scale?
- e. Should scores on the six scales be included in the unit Readiness Report?
- f. How can survey participants be most effectively assured that their responses will remain anonymous? and,
- g. Can results on the survey be used in a prescriptive manner (i.e., what remedial actions are suggested by low scores on particular scales)?

POTENTIAL VALUE OF THE INSTRUMENT

Beyond the theoretical and statistical issues which surround the instrument, it is important to consider its applied value. The measure has been designed primarily for SI's in the field operating Army. It is short, easily administered, hand scoreable, and immediately interpretable. For several reasons, these characteristics are believed to be necessary prerequisites to its adoption as a practical job aid to the SI.

SIs are typically trained and experienced in combat arms rather than in behavioral science. Hence the instrument must be meaningful to them and easily used by them.

Typically SIs have short tours of duty in this role as they await a command slot or are held in the unit following command time. Thus, to be an effective staff officer to his commander, he needs a means of quickly and accurately estimating the morale status of unit personnel.

While tenuous as an SI is short and many SI's lack specific training in their function, their duties are extensive. SI task analyses reveal 122 duties which are inherent in the position (USA Infantry School, Note 4) in addition to which the commander will likely assign further responsibilities to him. His time is quite limited, and thus at best, he is able to use only those means of assessing personnel which are rapid but do not substantially compromise validity.

Finally the instrument has been constructed with troops in mind. Longer and more verbally complex surveys are often difficult for them to attend to or to understand. In that the Army's peacetime mission is to train for combat, time spent away from training such as personnel management activities must be limited. The brevity of this scale, its true-false format, and its simple wording are thus supportive in accomplishing this peacetime mission.

ADDENDUM

The instrument described in this report is assigned P.T. number

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APPENDIX

TABLE A

Percentage of Subjects Answering in High, Neutral or Low Response Categories^a
on the Motivation Scale

Item	Percent in Responses Category		
	High	Neutral	Low
Amount of effort in work	25	24	51
Involved in job	57	25	18
Time seems to drag	68	12	20
Do "extra" work	32	16	53
Work harder than peers	10	46	45

^aHigh, Neutral, and Low for original five or seven point scales refer respectively to highest possible responses, single midpoint response, and lowest possible responses. For original dichotomous scales no neutral response is possible. Percentages for items scored negatively reflect the scale reversal.

TABLE B

Percentage of Subjects Answering in High, Neutral, or Low Response Categories^a
on the Army Satisfaction Scale

Item	Percent in Response Categories		
	High	Neutral	Low
Opportunities for worthwhile work	52	24	24
Opportunities for interesting work	57	22	21
Army's policies and practices	57	27	16
Amount of personal freedom	58	22	20
Opportunities for using abilities	54	23	23
Amount of recognition for good work	56	25	18
Opportunities for training	48	27	26
Opportunities for planning life	51	23	26
Immediate supervisors	46	24	29
Working conditions	53	25	22
Army attitude in civilian life	43	29	28
Army vs other organizations	65	23	13
Happy now vs before joining	56	29	16

^aHigh, Neutral, and Low for original five or seven point scales refer respectively to highest possible responses, single midpoint response, and lowest possible responses. For original dichotomous scales no neutral response is possible. Percentages for items scored negatively reflect the scale reversal.

TABLE C

Percentage of Subjects Answering in High, Neutral, or Low Response Categories^a
on the Work Satisfaction Scale

Item	Percent in Response Categories		
	High	Neutral	Low
Real enjoyment in work	52	21	26
All in all, job satisfaction	48	30	23
Interest in job	33	34	33
Feeling of pride from work	40	26	33
Satisfying work	50	9	41
Sense of accomplishment at work	52	8	39
Boring work	58	8	35
Challenging work	55	7	38

^aHigh, Neutral, and Low for original five or seven point scales refer respectively to highest possible responses, single midpoint response, and lowest possible responses. For original dichotomous scales no neutral response is possible. Percentages for items scored negatively reflect the scale

TABLE D

Percentage of Subjects Answering in High, Neutral, or Low Response Categories^a
on the Satisfaction With Supervisor Scale

Item	Percent in Response Categories		
	High	Neutral	Low
Satisfaction with supervisor	50	29	21
Supervisor's good vs bad traits	30	40	30
Annoying supervisor	49	6	44
Intelligent supervisor	42	12	46
Bad supervisor	32	13	55
Supervisor around when needed	47	10	43
Impolite supervisor	36	8	56
Supervisor praises good work	54	10	36
Supervisor knows job well	42	11	46
Hard to please supervisor	49	7	44
Stubborn supervisor	51	7	42
Up-to-date supervisor	54	8	38
Lazy supervisor	31	9	60
Supervisor encourages extra effort	38	35	27

^aHigh, Neutral, and Low for original five or seven point scales refer respectively to highest possible responses, single midpoint response, and lowest possible responses. For original dichotomous scales no neutral response is possible. Percentages for items scored negatively reflect the scale reversal.

TABLE E

Percentage of Subjects Answering in High, Neutral, or Low Response Categories^a
on the Satisfaction With Co-Workers Scale

Item	Percent in Response Categories		
	High	Neutral	Low
Stupid co-workers	22	10	68
Unpleasant co-workers	22	9	69
Lazy co-workers	33	11	56
Intelligent co-workers	28	12	59
Slow co-workers	40	9	52
Responsible co-workers	35	10	56
Active co-workers	37	11	52
Easy to make co-worker enemies	30	10	60
Boring co-workers	31	8	61
Loyal co-workers	36	16	49
Smart co-workers	31	14	55
Co-workers talk too much	31	7	62
Co-workers have narrow interests	35	12	54
Hard to meet co-workers	20	10	70
Fast co-workers	50	12	38
All in all, work group satisfaction	25	43	32

^aHigh, Neutral, and Low for original five or seven point scales refer respectively to highest possible responses, single midpoint response, and lowest possible responses. For original dichotomous scales no neutral response is possible. Percentages for items scored negatively reflect the scale reversal.

TABLE F

Percentage of Subjects Answering in High, Neutral, or Low Response Categories^a
on the Satisfaction with Pay Scale

Item	Percent in Response Categories		
	High	Neutral	Low
Bad pay	45	10	45
Underpaid	62	10	27
Adequate income for normal expenses	54	6	39
Barely live on income	48	8	44
Pay satisfaction considering skills and effort	53	32	15
Pay is less than I deserve	52	10	38
Insecure pay	39	10	51
Satisfactory benefits	39	7	54

^aHigh, Neutral, and Low for original five or seven point scales refer respectively to highest possible responses, single midpoint responses, and lowest possible responses. For original dichotomous scales no neutral response is possible. Percentages for items scored negatively reflect the scale reversal.